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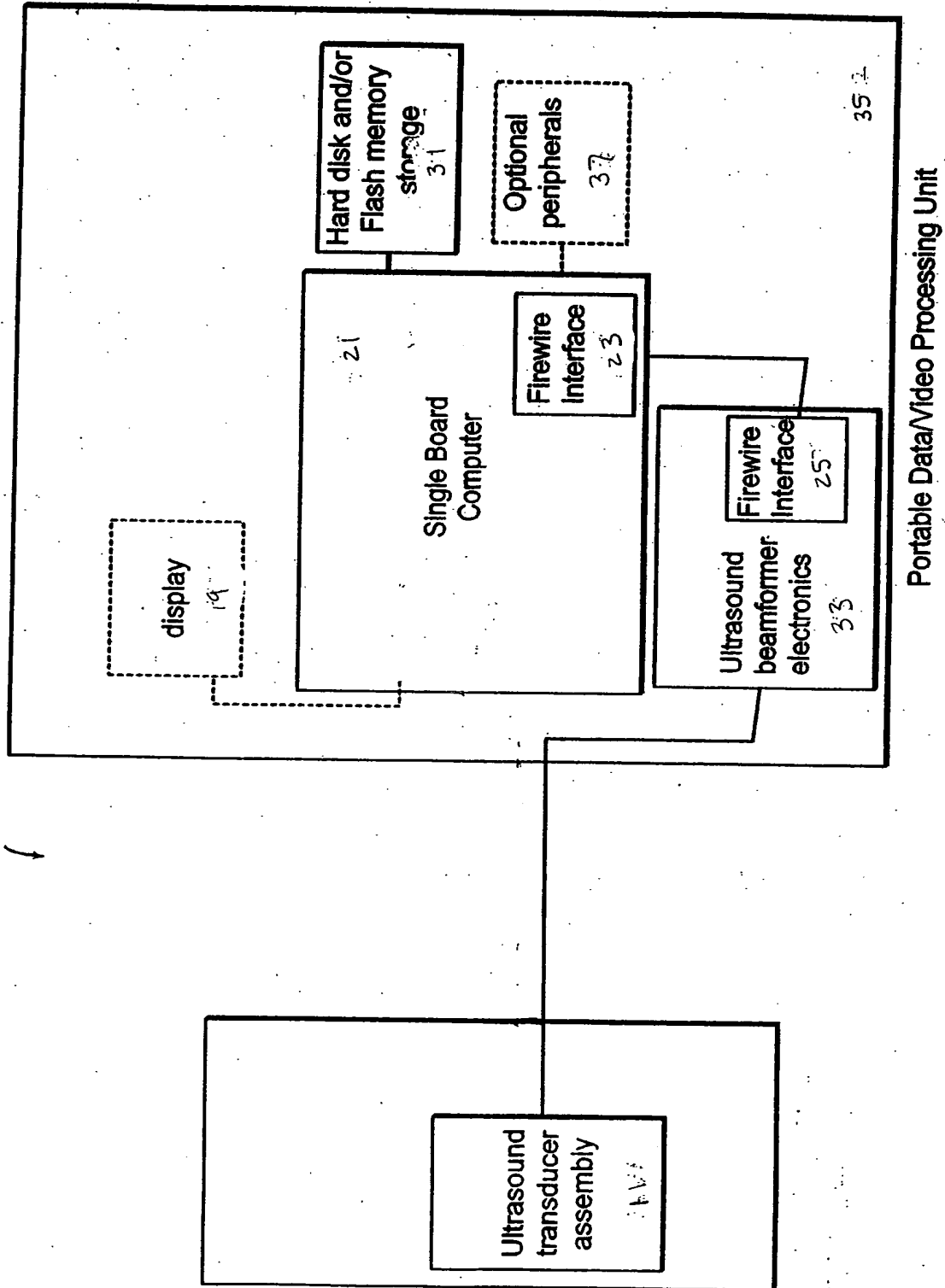


FIG. 1A

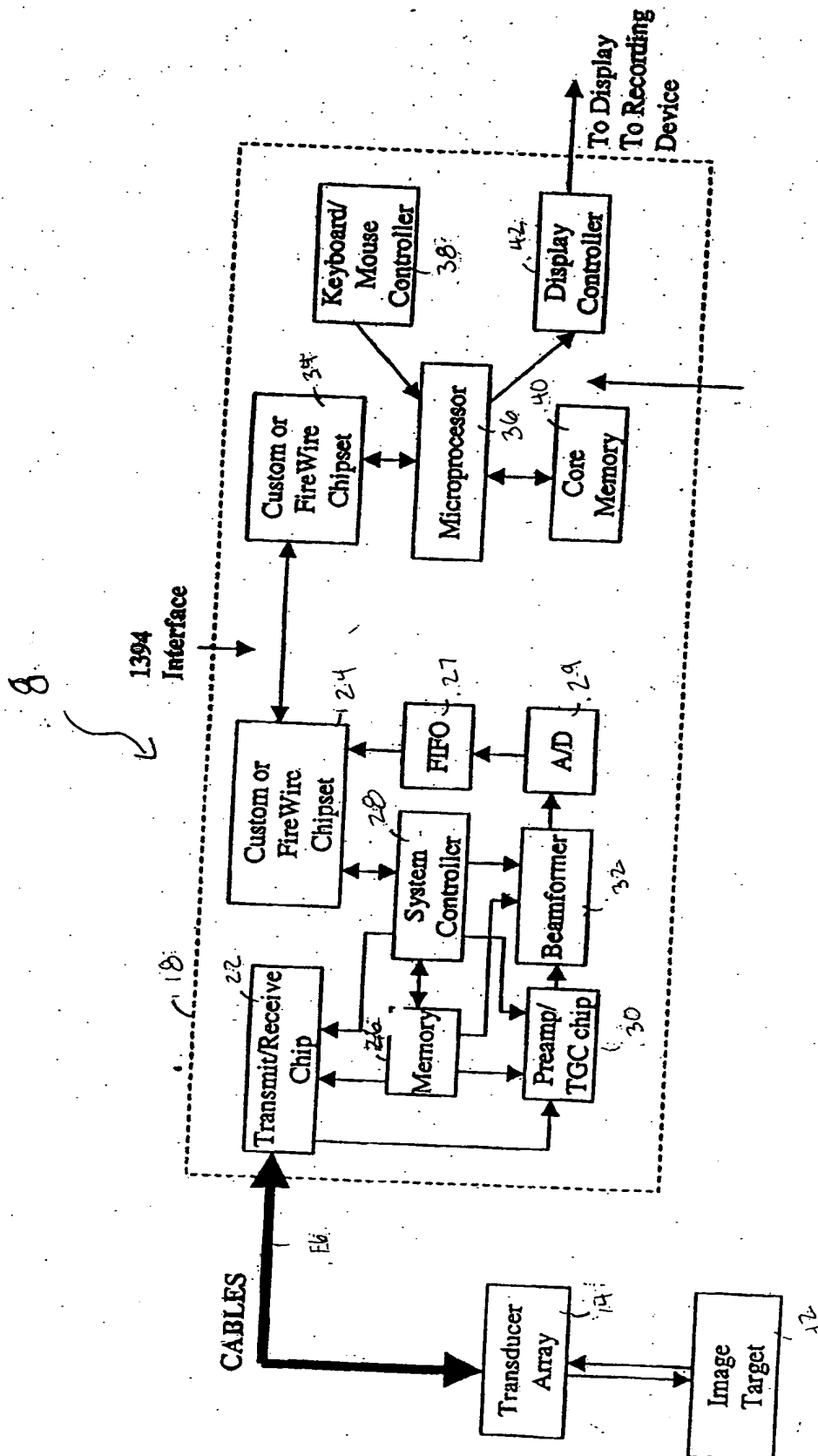


FIG. 1B

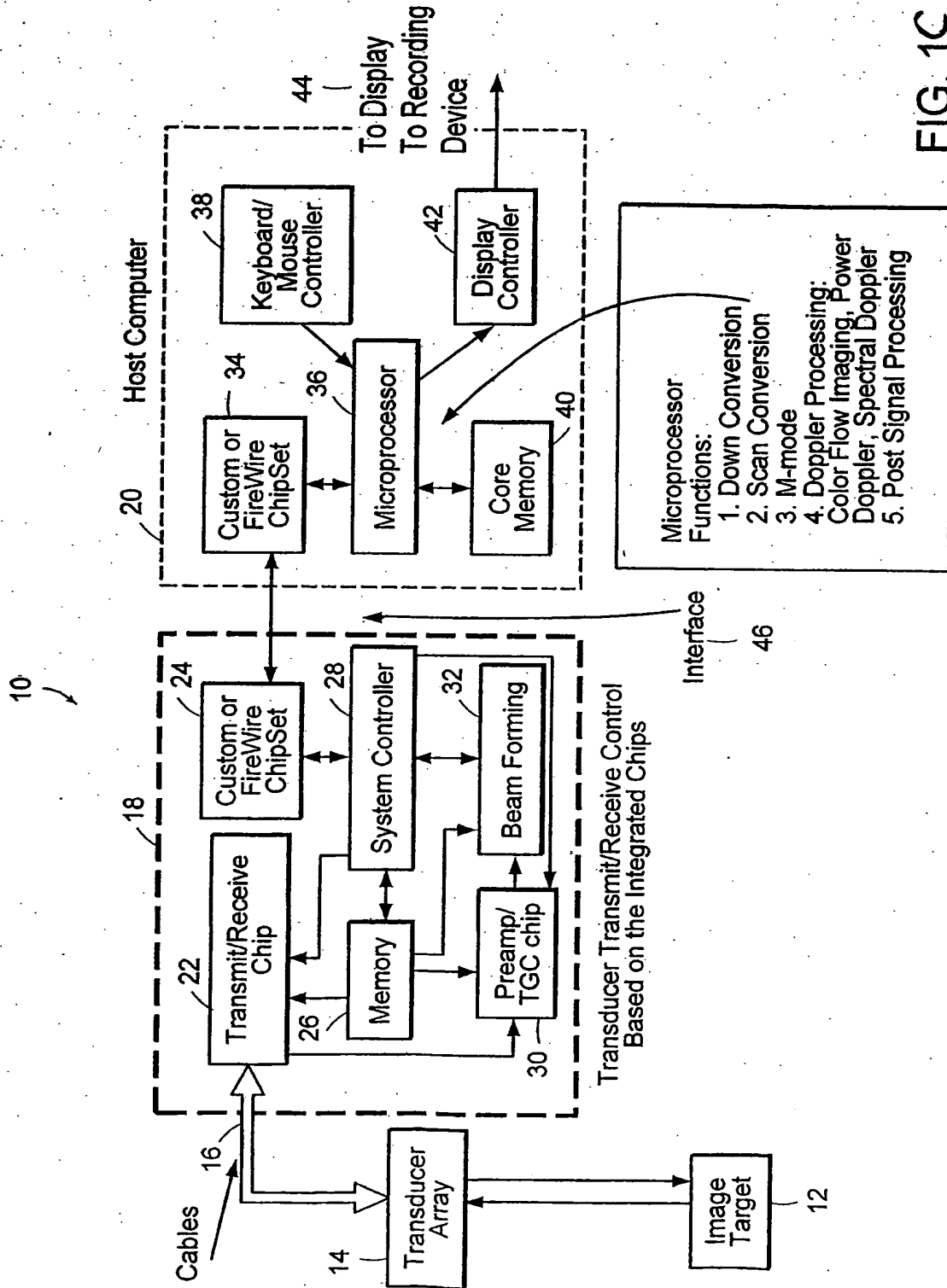


FIG. 1C

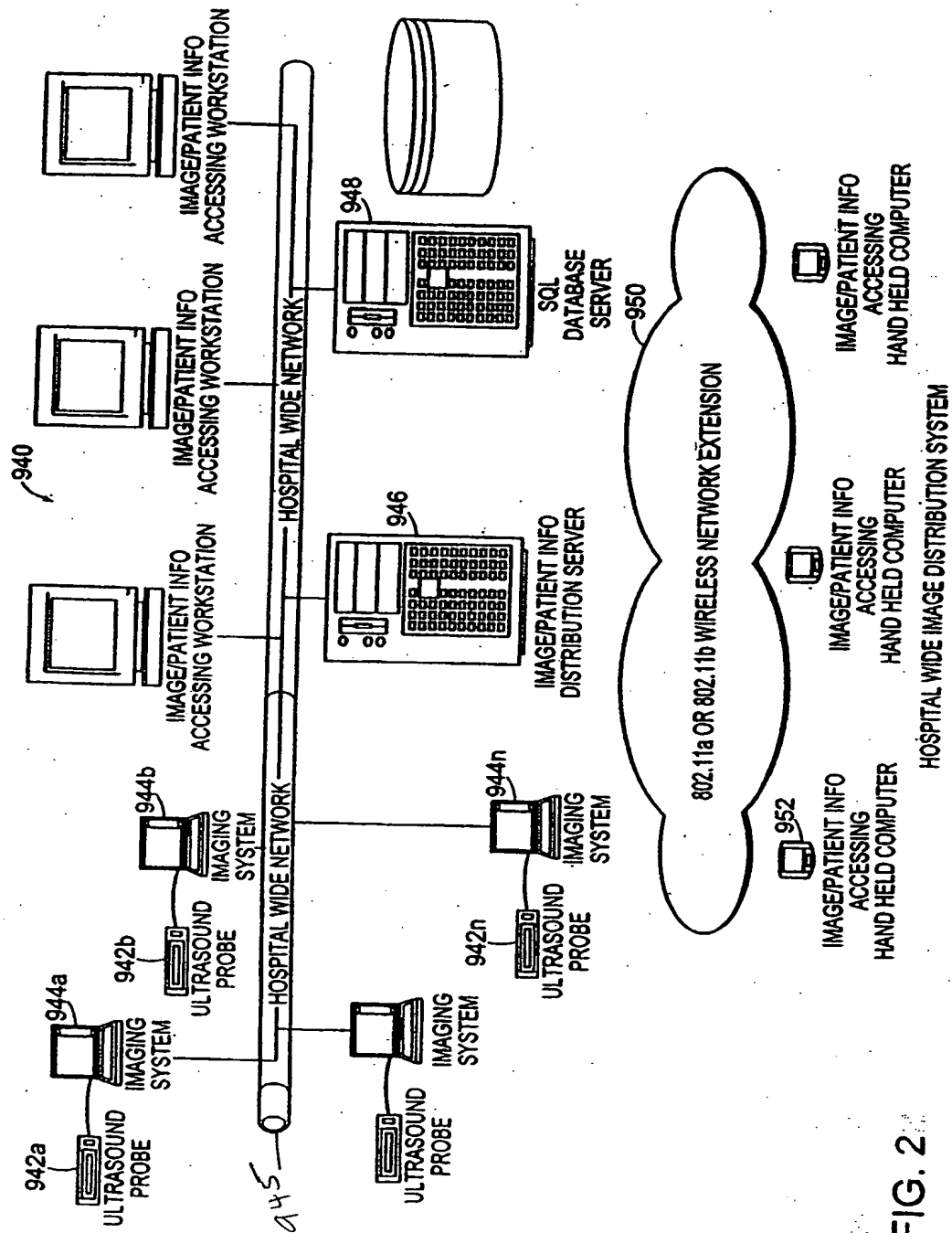
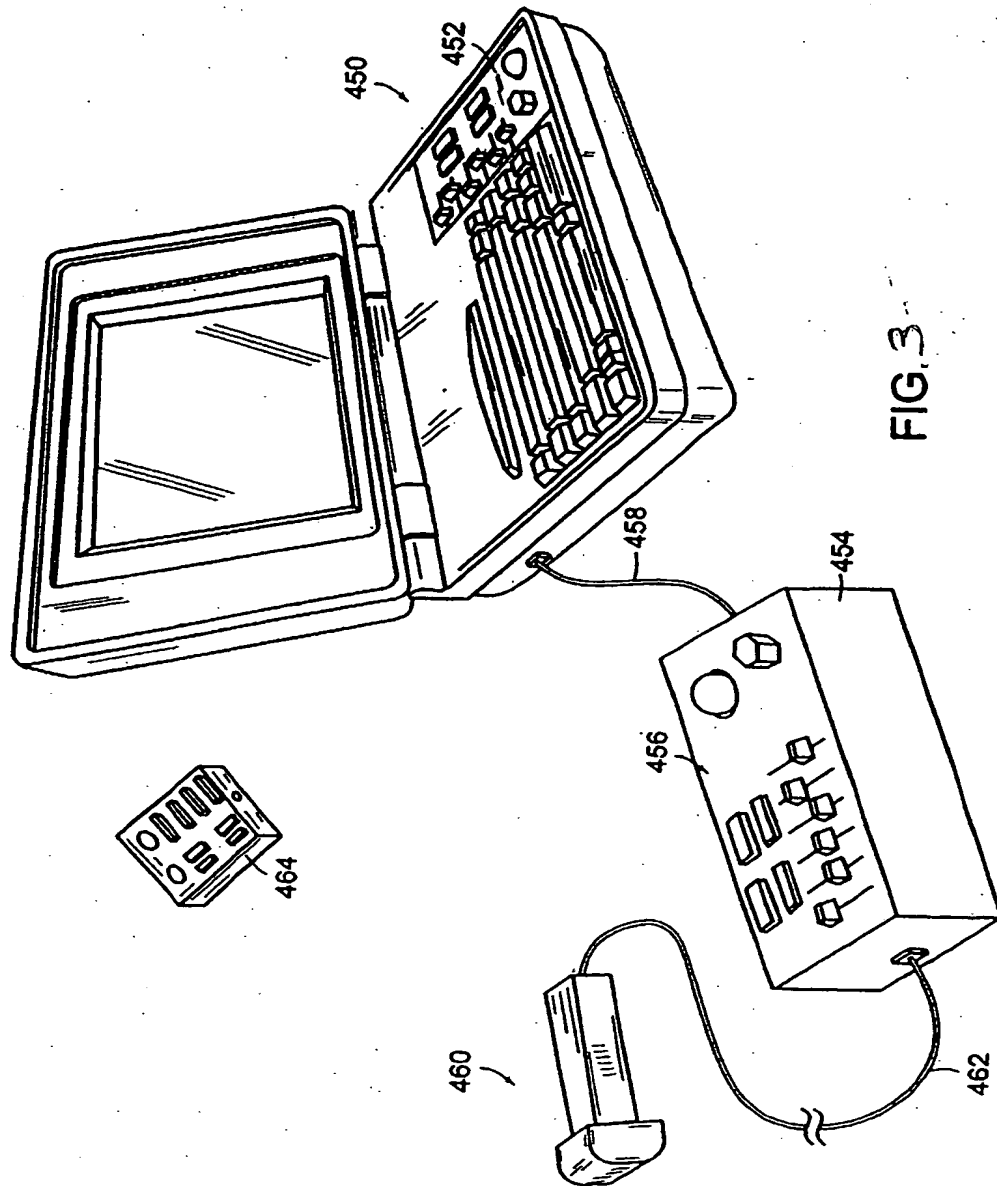
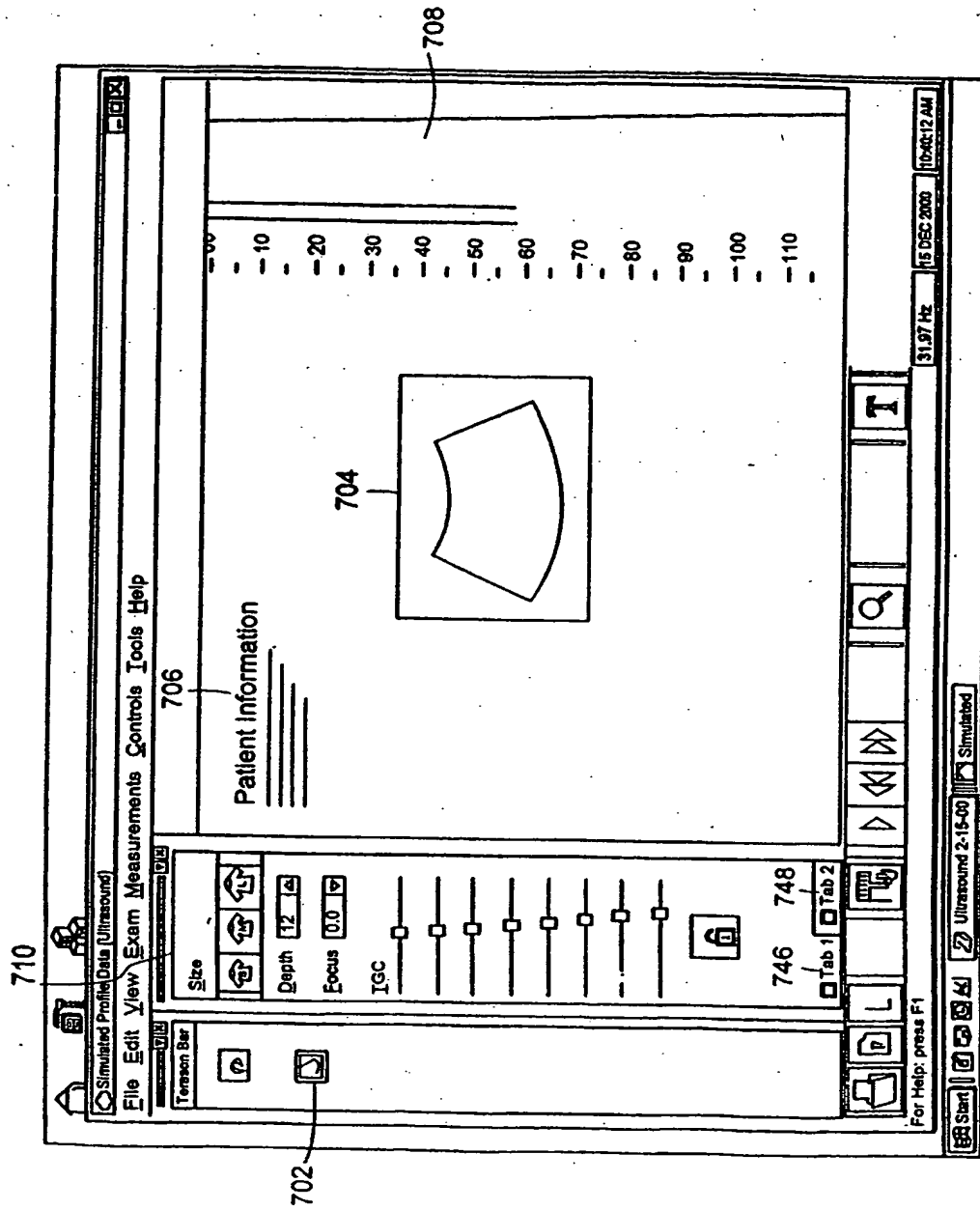


FIG. 2





## Apical Four-Chamber Duplex or Triplex Tissue Doppler Imaging

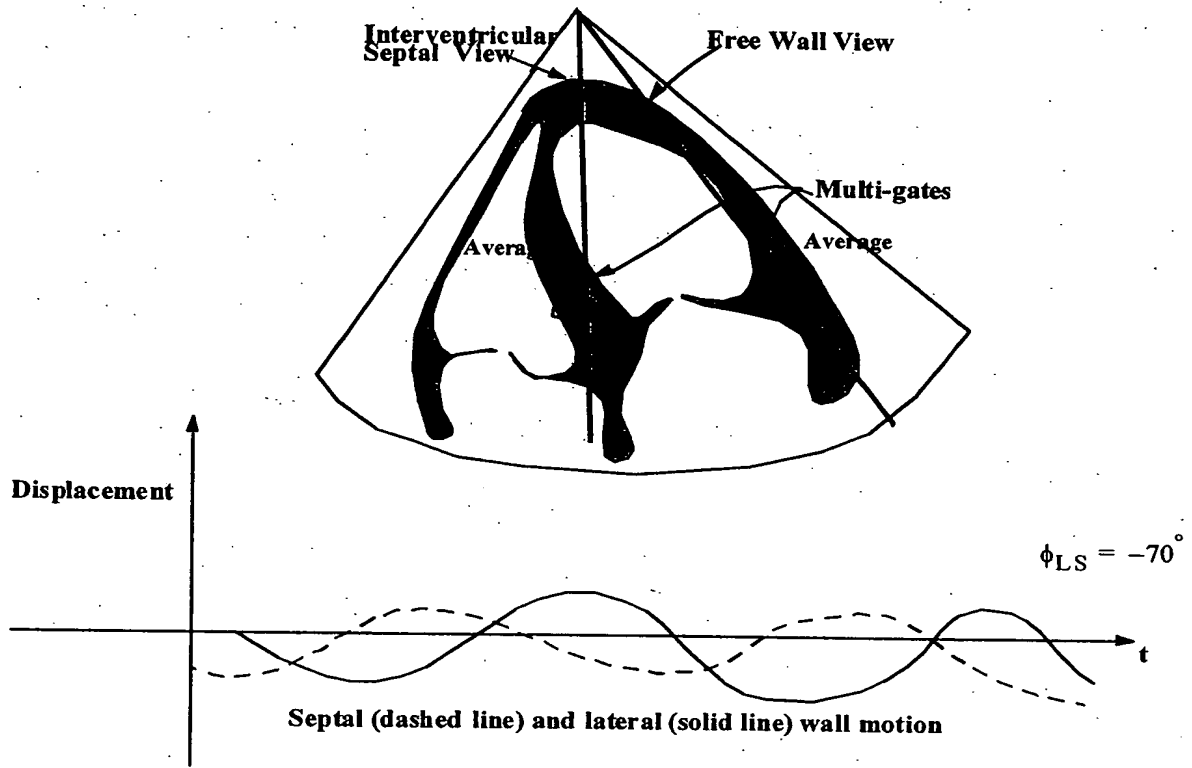
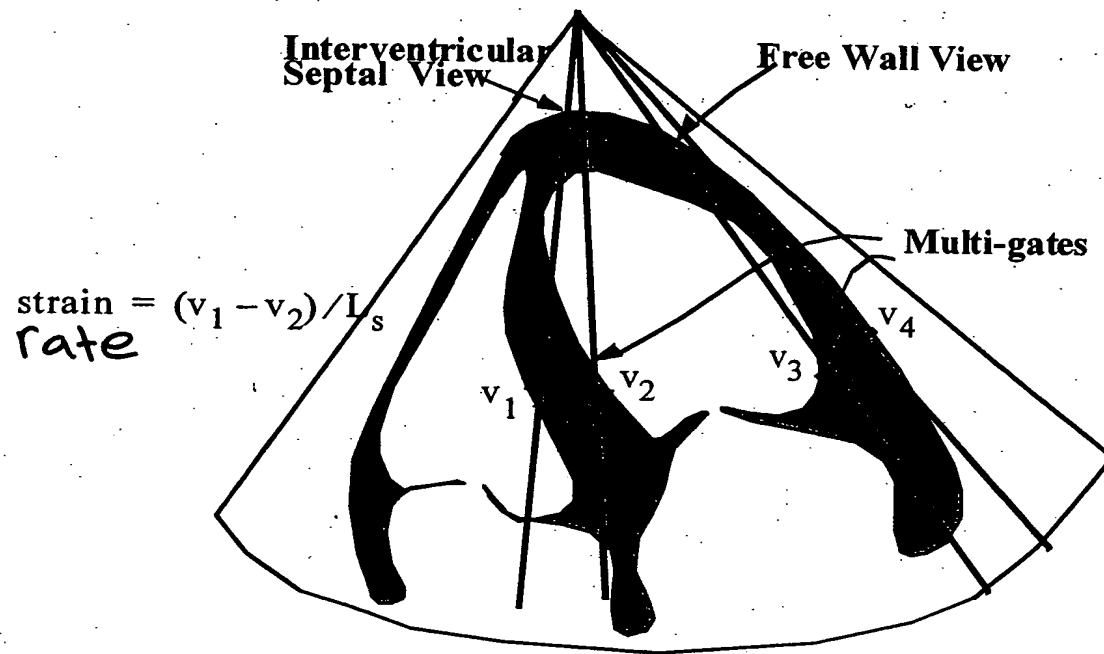


FIG. 5





**Measurement of Strain Rate by using Multi-direction PW Spectral Doppler lines**

Fig 6

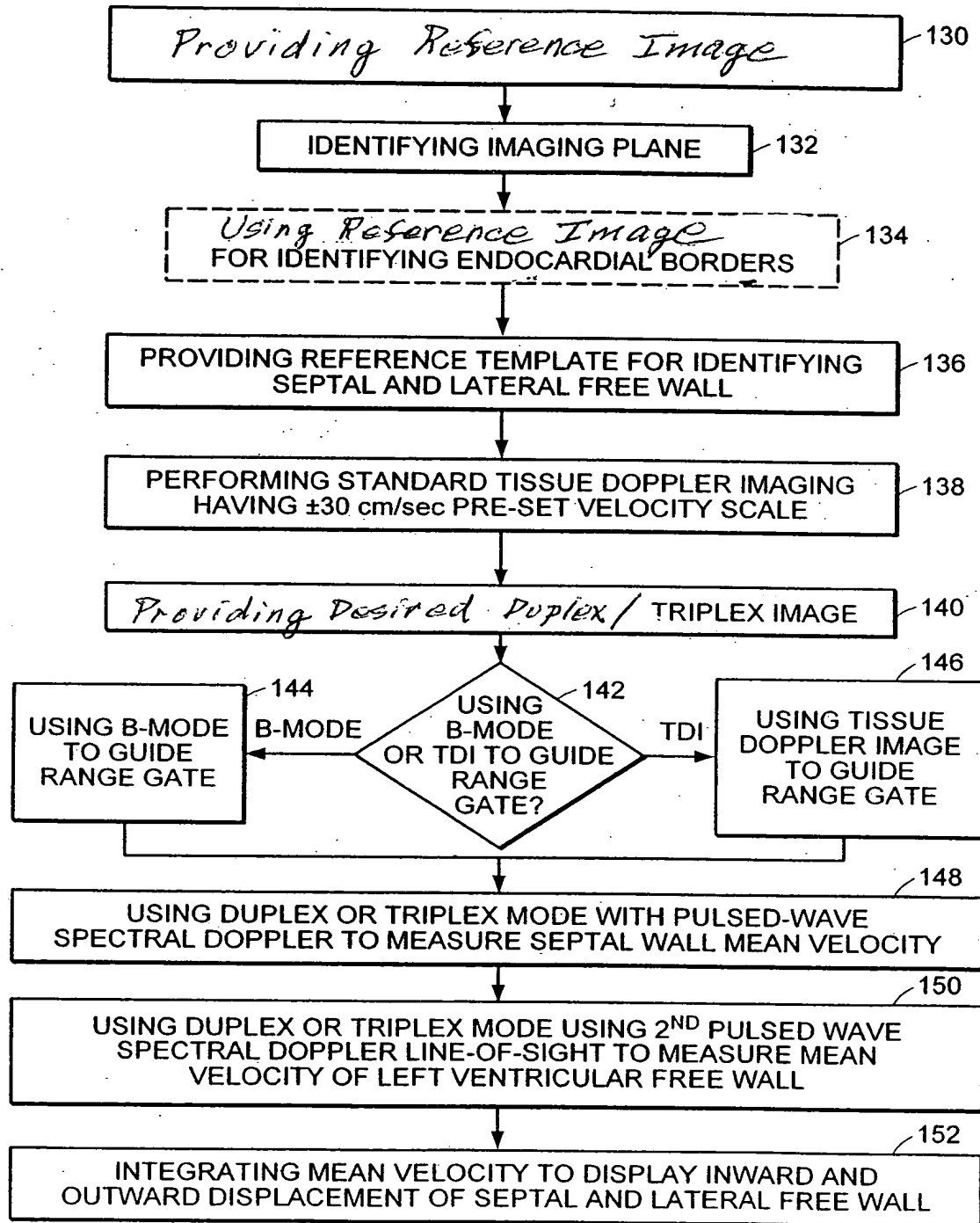


FIG. 7

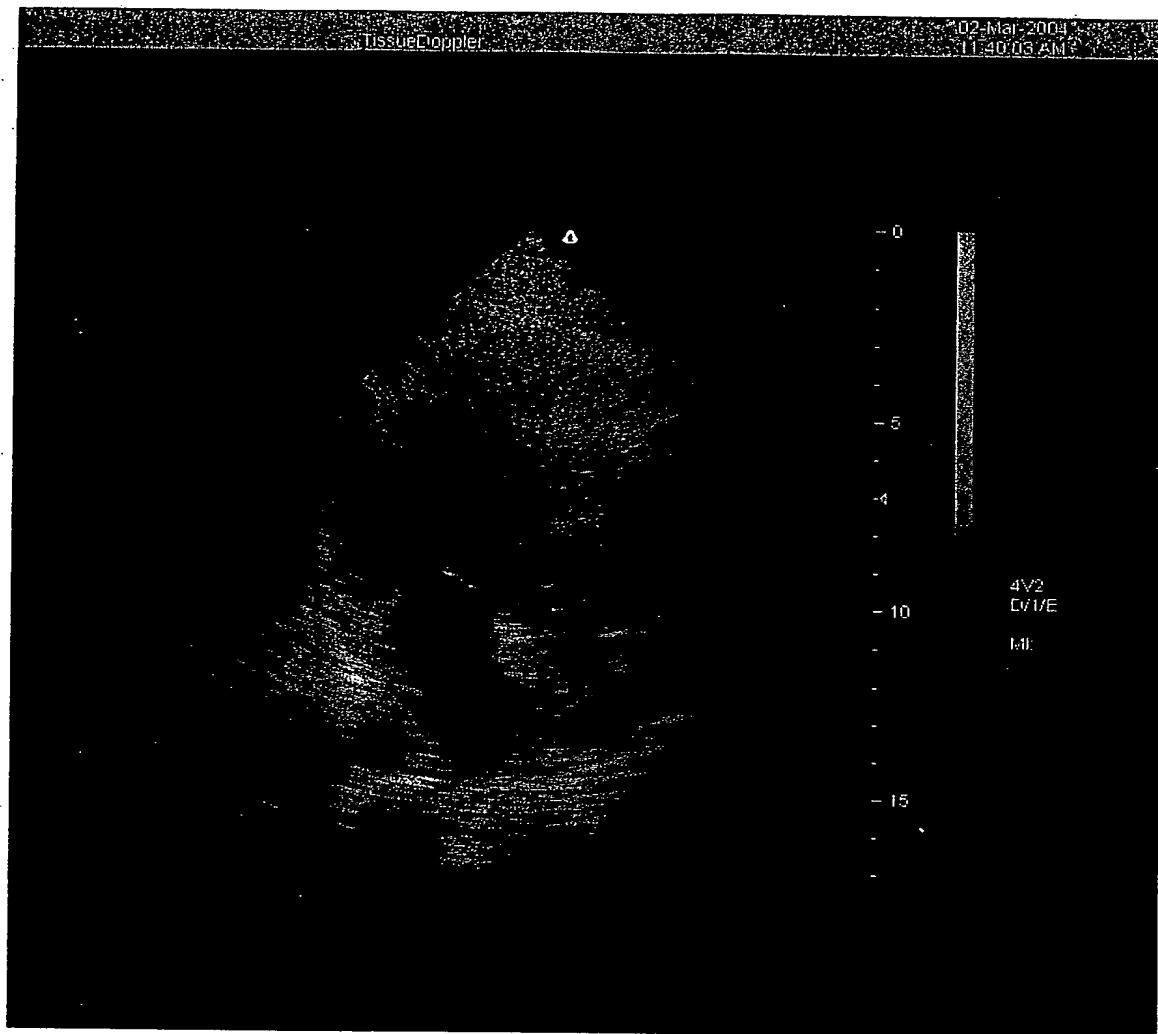
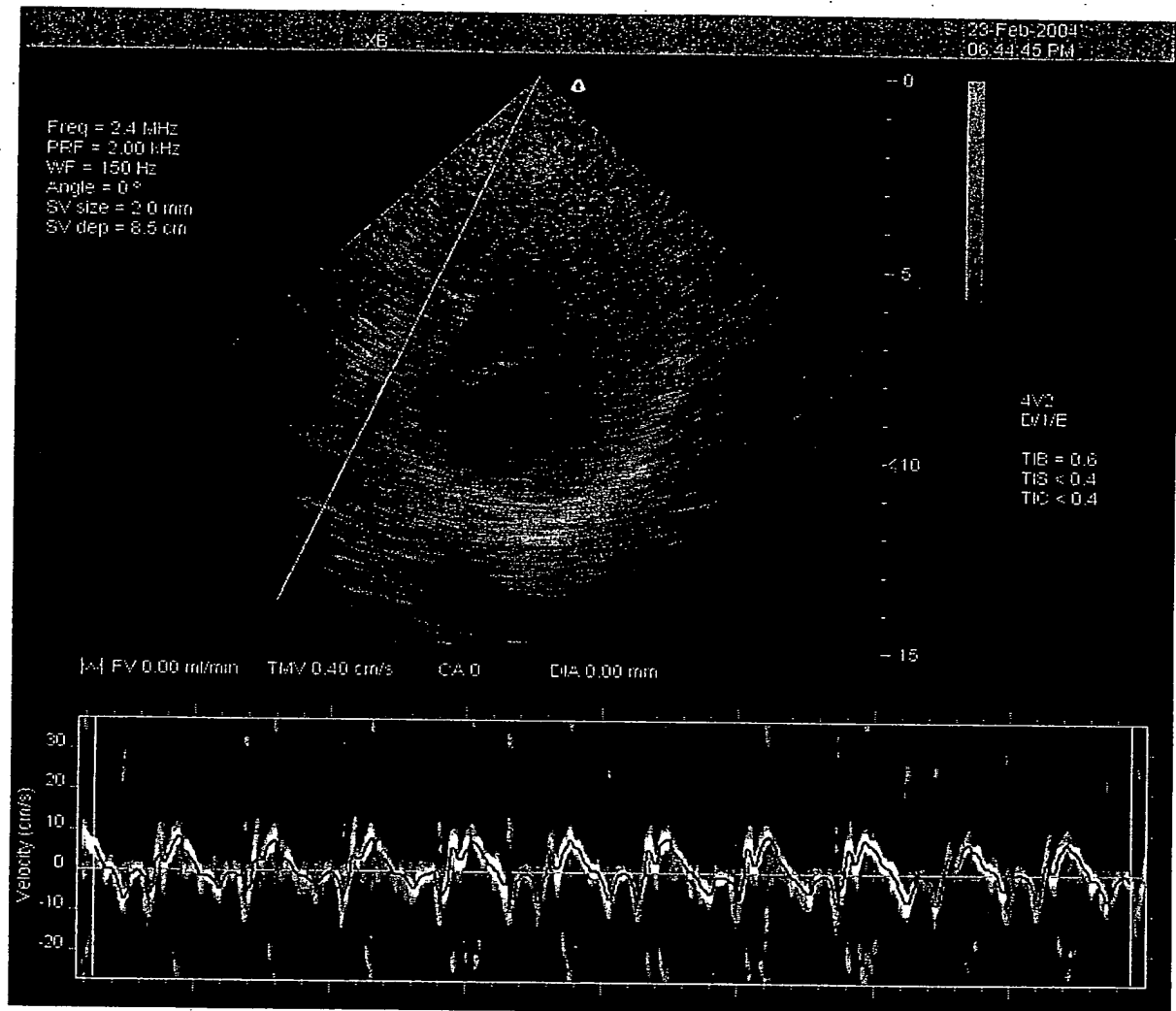
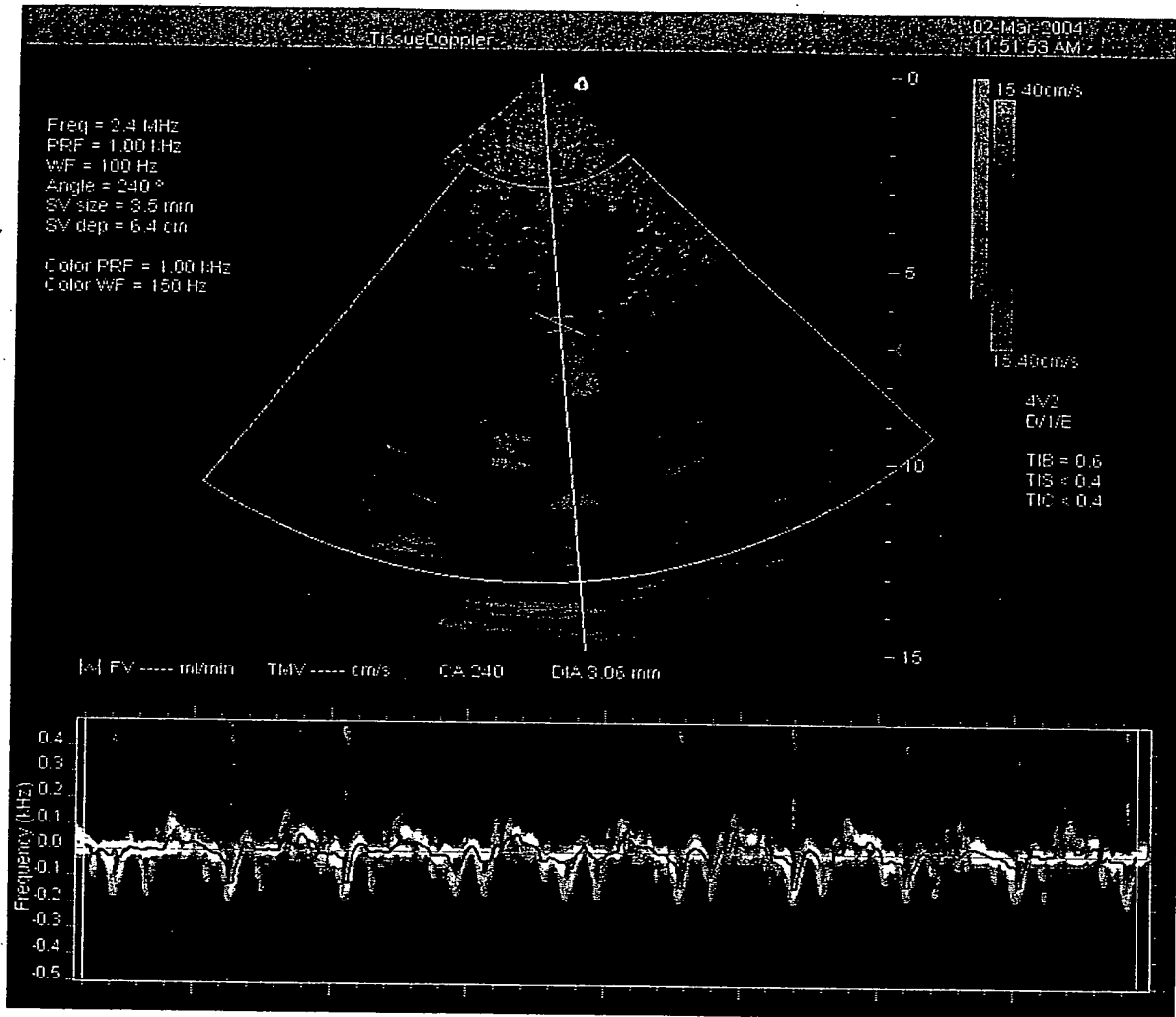


Fig. 8



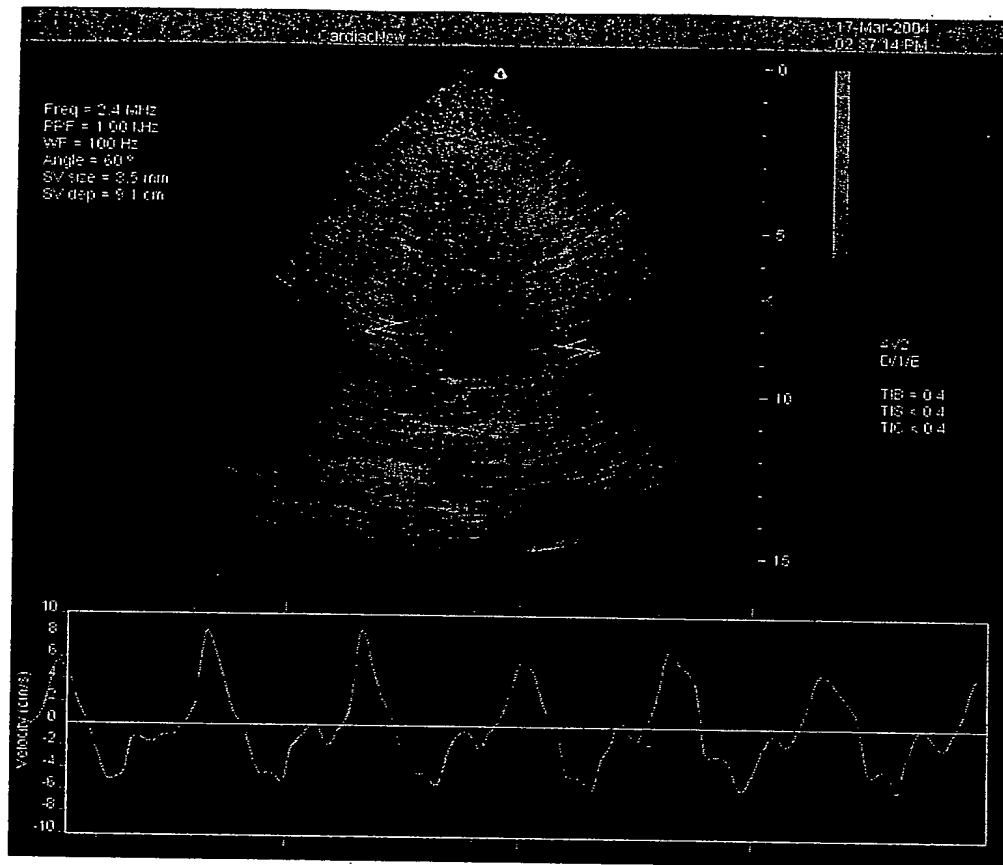
Pulsed Wave Tissue Doppler image

Fig. 9



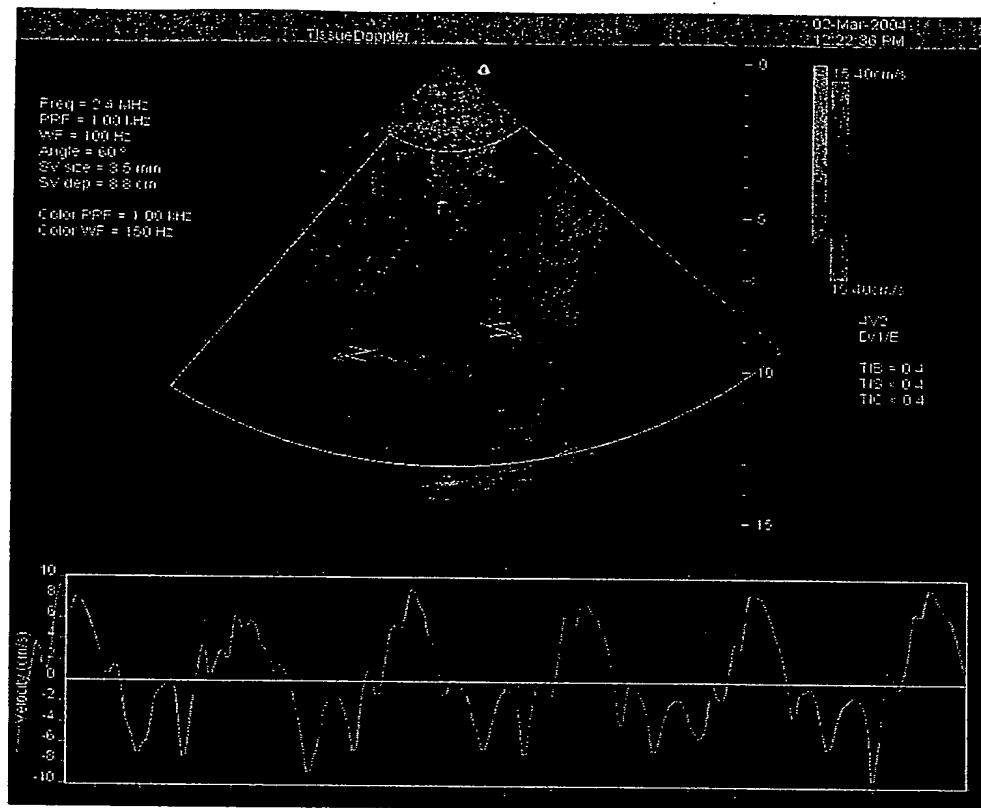
Triplex Tissue Doppler

Fig. 10



Duplex with two spectral lines one each on septal and lateral free walls, the graphs displayed are mean velocity.

Fig. 11A



**Triplex with two spectral lines one each on septal and lateral free walls, the graphs displayed are mean velocity.**

Fig. 11B

### Apical Four-Chamber Duplex or Triplex Tissue Doppler Imaging

- **At least two PW Spectral Doppler Views,**
  - At least one each at interventricular Septal wall and Free Wall
- **Multi-gate structure along each PW Spectral view**
  - Regional wall movement can be displaced at each range-gate position.
  - Global movement/displacement of each wall can be obtained by averaging over those range-gates.

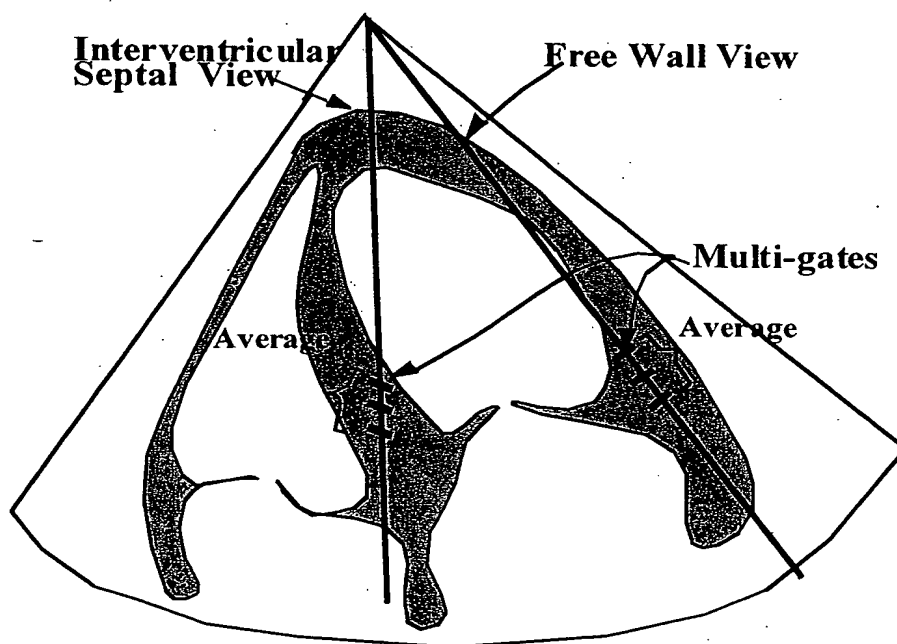


Fig 12



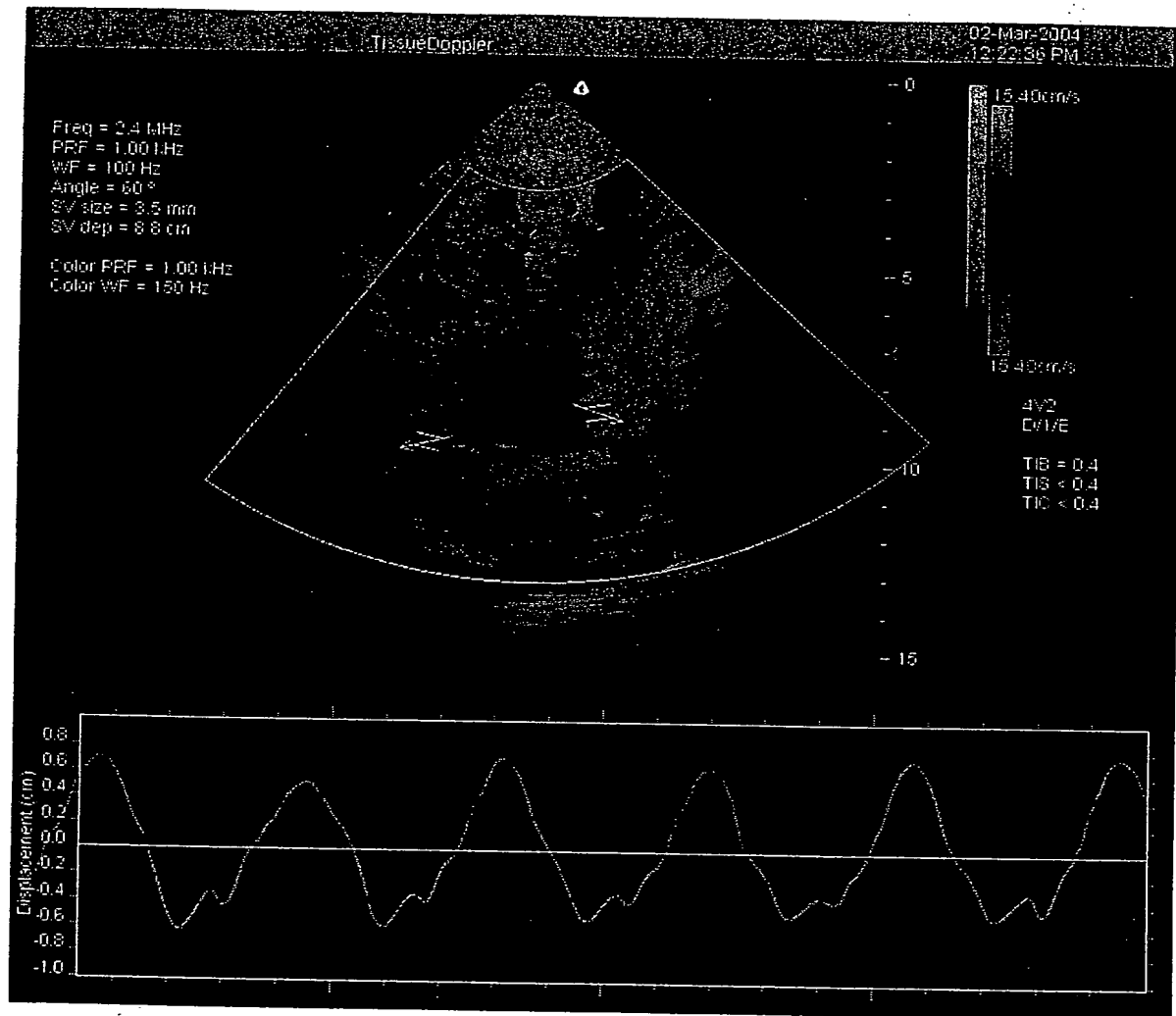
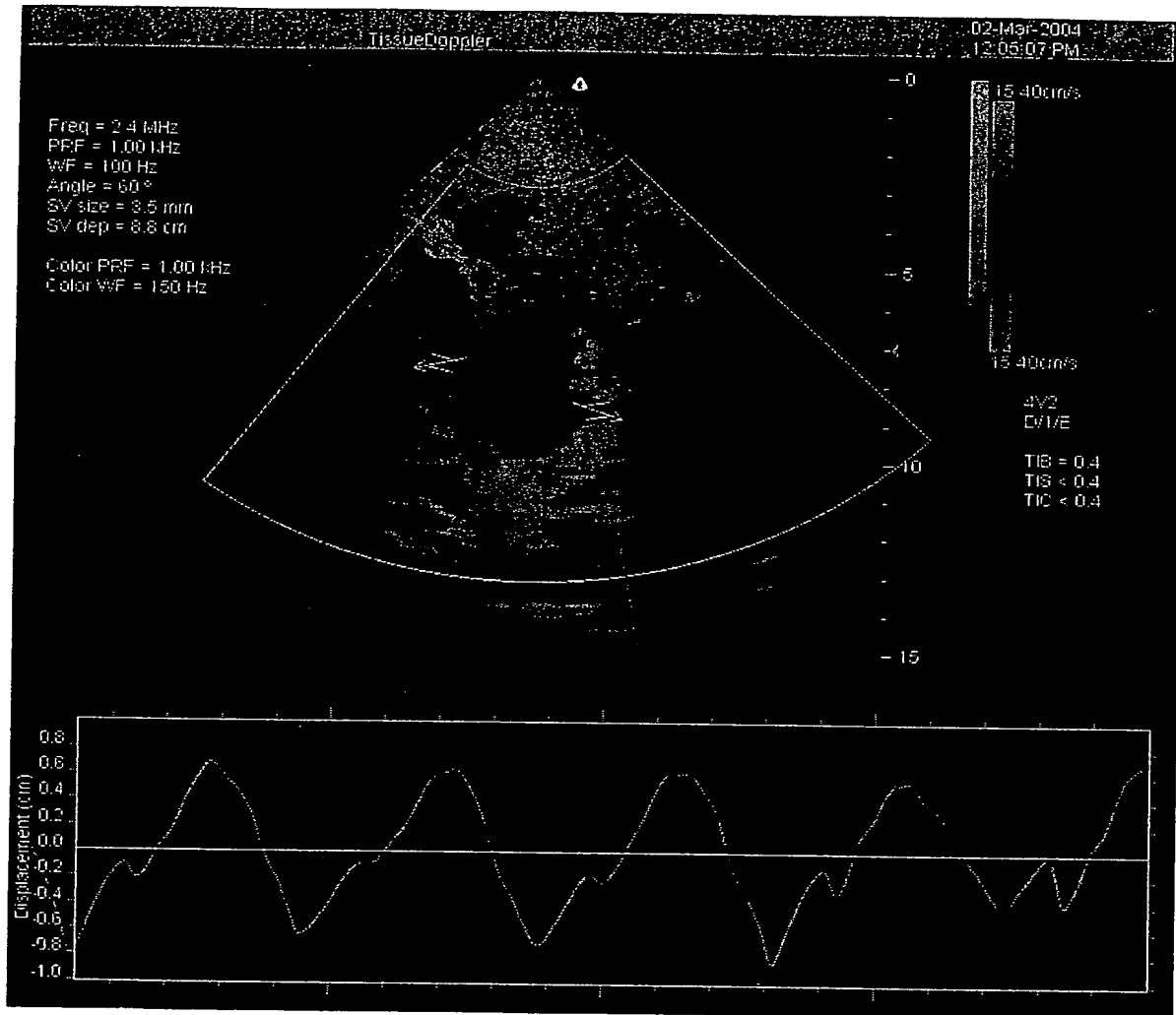


Fig. 13: Triplex with two spectral lines one each on septal and lateral free walls, the graphs displayed are displacement. The same data as *Fig. 11A*.

Fig. 13A



Another example of Displacement detection

Fig. 13B

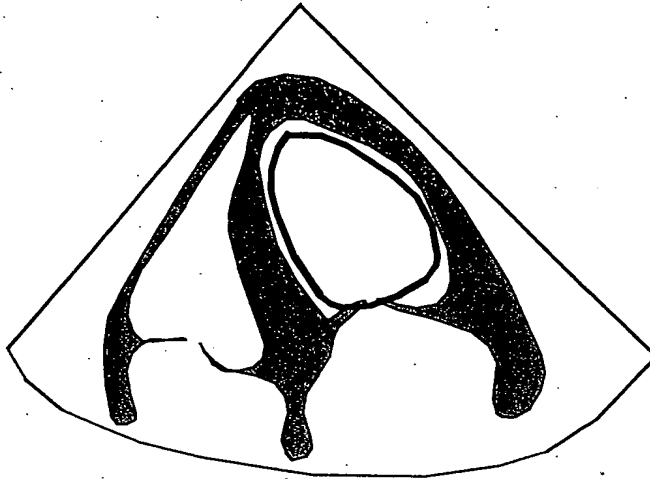
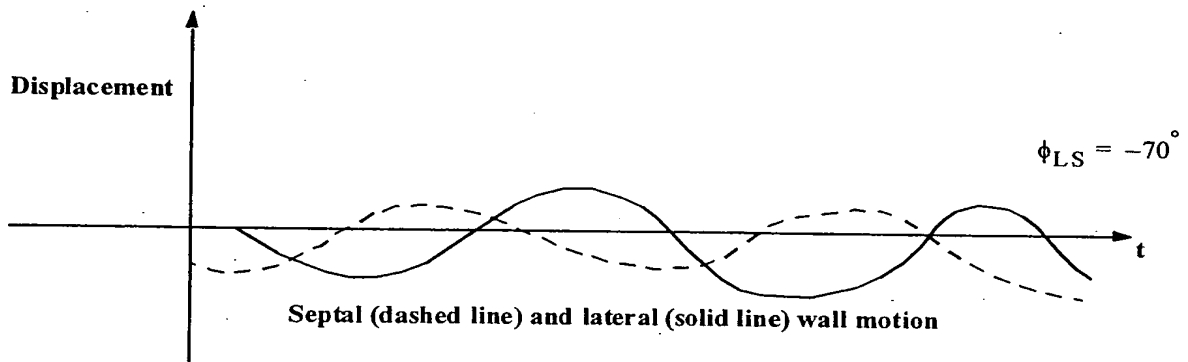


Fig. 14



Automatic Border detection allows continuously detect and track the interventricular Septal Wall and Lateral Free Wall movement.

Fig. 15

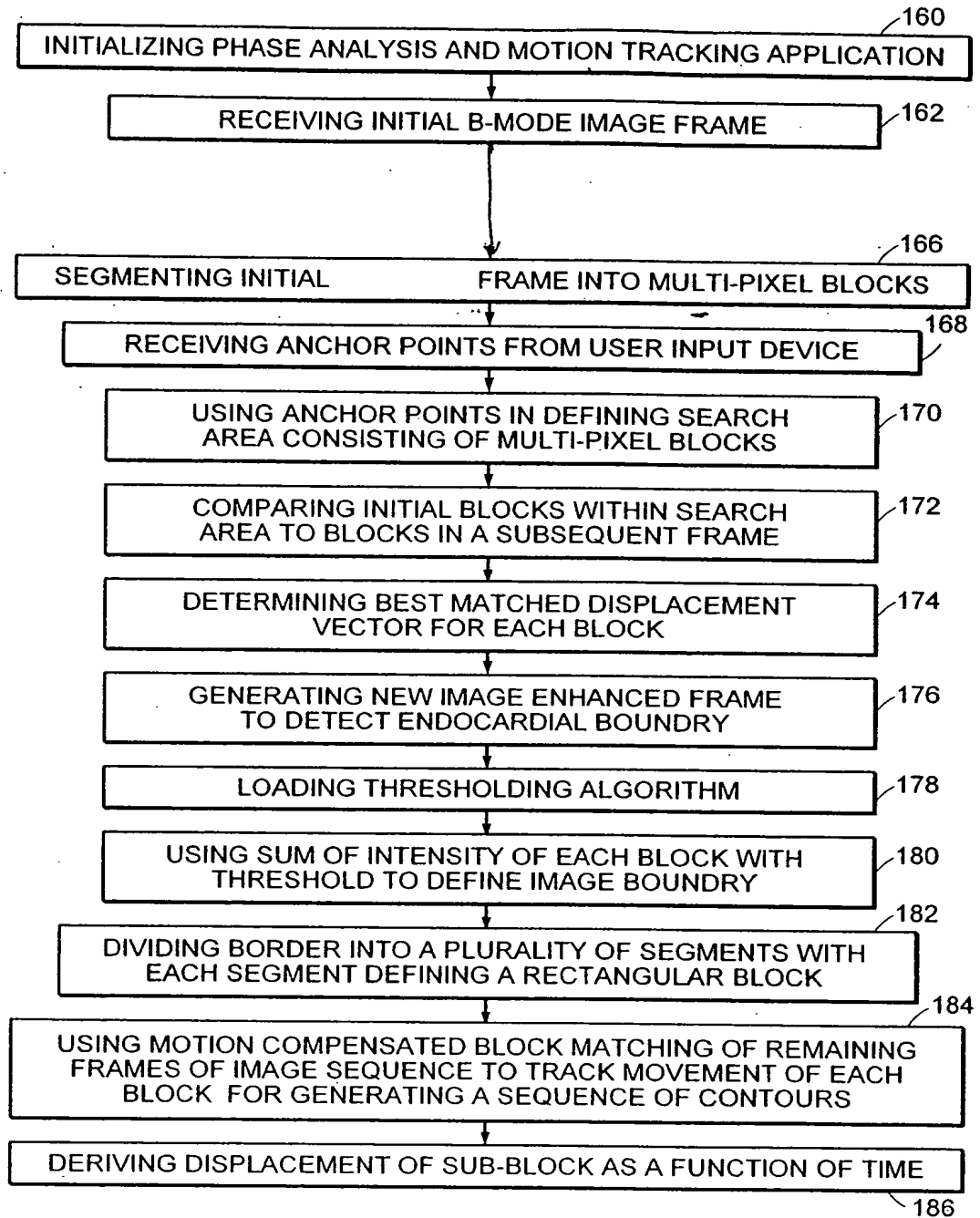
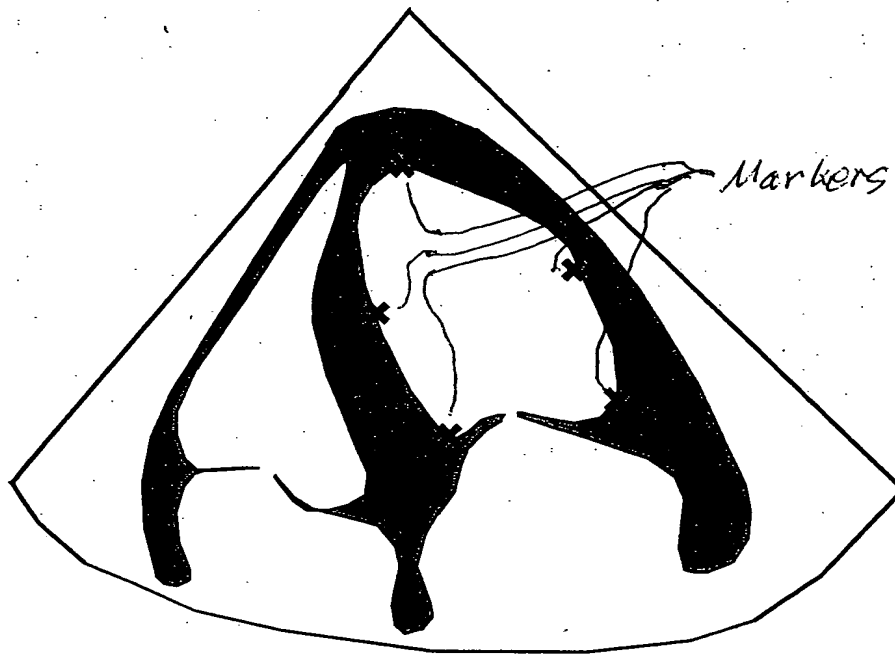


FIG. 16

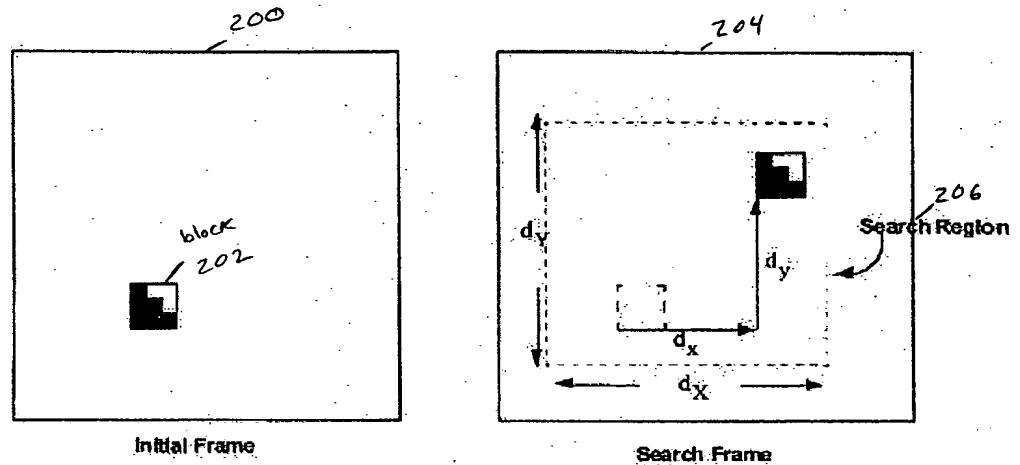


**Fig. 17: Manually placed 5 anchor point on a 4-Chamber Apical view B-mode image**

Fig. 17

### Motion Compensated Block Matching Search Algorithm

- considering a block in an initial frame and
- searching for the displacement which produces the "best match" among possible search region in an adjacent frame.



In this example, the search region is  $-d_x/2 \leq x \leq d_x/2$  and  $-d_y/2 \leq y \leq d_y/2$   
and the motion estimated displacement vector is  $(d_x, d_y)$ .

Fig 18

## Block Intensity Guided Border Detection Technique

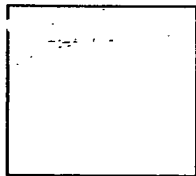
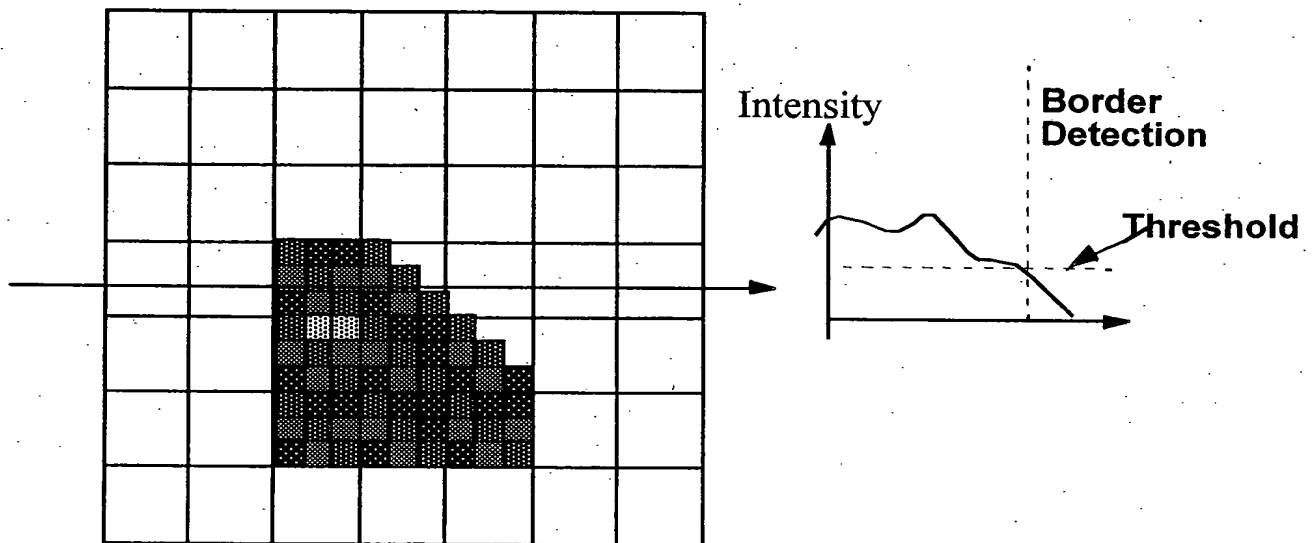


Fig. 19

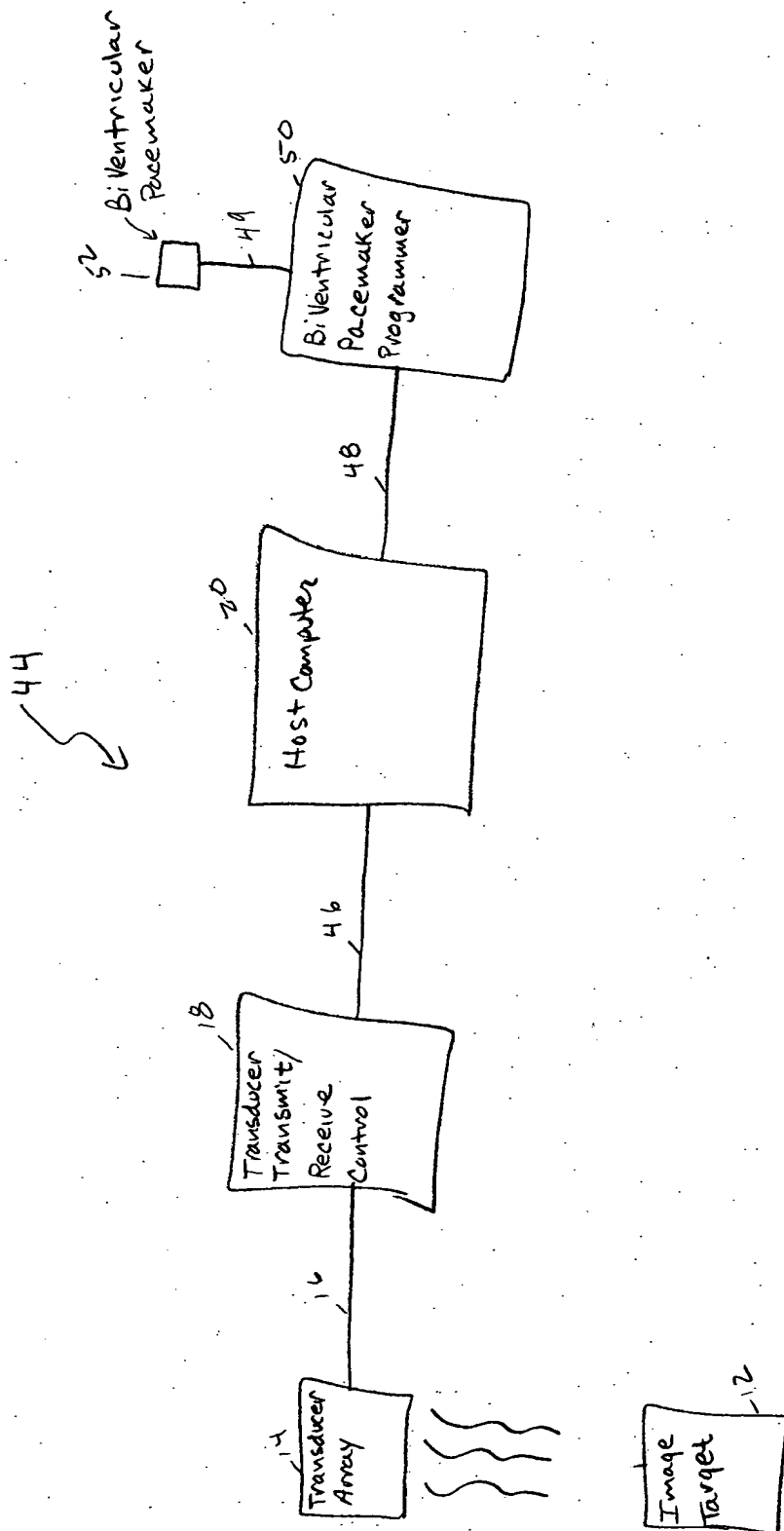


Fig. 20